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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. WASHINGTON, DC 20037			ALCALA, JOSE II	
			ART UNIT	PAPER NUMBER
			2827	

DATE MAILED: 11/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/806,203

Applicant(s)

EN ET AL.

Examiner

José H Alcalá

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 June 2003.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27, 29-66 is/are pending in the application.
- 4a) Of the above claim(s) 1-24 and 33-63 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 25-27, 29-32 and 64-66 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other:

DETAILED ACTION

1. This final rejection is in response to amendment filed on 6/24/03.

Claim Objections

2. Claims 64 and 66 are objected to because of the following informalities: The claims include elements claimed using the acronyms PVD,CVD,RA instead of the complete name of the element, process or unit. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 65 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The limitation that: "said polyolefin resin has a dielectric constant value not more than 3 and dielectric loss tangent value not more than 0.05 ", is not described as such in the specification. Instead, the ranges given in the Specification are a dielectric constant value not more than 3 and dielectric loss tangent value not more than 0.01 (see page 11, lines 10 and 11).

Claim 66 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The limitation that said resin insulating layer has a surface with: "an average roughness value of RA being not more than 1 μm ", is not described as such in the Specification

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 25-27, 29-32, 64-66 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding Claim 25, it is not clear what are the possible combinations of constituents of the resin insulating layers according to the invention. It is not clear which possible material combinations are contemplated in the claim: 1) a thermosetting polyolefin resin, 2) a thermosetting polyolefin resin and a thermoplastic resin, 3) any thermosetting resin and a thermoplastic resin, or 4) a thermoplastic resin. Furthermore, the recitation: "circuits are formed on the layers by way of a metal layer", is unclear and indefinite. Is the recitation merely a process for making the circuits? Is the metal layer part of the conductor circuits, or a separate element altogether?

Regarding Claim 30, it is unclear if each of said conductor circuits has an additional metal layer located on its surface. If that is the case, the element should be

labeled accordingly to avoid confusion between the metal elements. Furthermore, it is unclear if the "interlayer resin insulating layer" is merely a label for the "resin insulative layers" of claim 25, or if it is a new layer that is added to the invention. If that is a new element, the claim is further incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: what is the exact location of the "interlayer resin insulating layer", with regard to the rest of the elements of the circuit board.

Regarding Claim 66, it is not clear what the acronym RA stands for.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 25-27, 29, 64-66 are rejected under 35 U.S.C. 102(b) as being anticipated by Oodaira et al. (US Patent No. 4,715,126). As best understood by the examiner:

Regarding Claim 25, Oodaira teaches a multilayer printed circuit board (Device of Figure 7) comprising a resin substrate board (reference number 85) carrying, on both sides thereof, resin insulating layers (reference number 80) comprised of the same resin material (column 3, lines 34-36) and a conductor circuit (reference number 83) built on each of said resin insulating layers, wherein said resin insulating layers comprise a

thermosetting polyolefin resin (column 3, line 25), and each of said conductor circuits(reference number 83) are formed on the surfaces of said resin insulating layers by way of a metal layer (reference number 83) composed of at least one metal selected from among metals (exclusive of Cu) of the 4th through 7th periods in Group 4A through Group IB of the long-form periodic table of the elements, Al and Sn (column 3, lines 28-32).

Regarding Claim 26, Oodaira teaches that each of said metal layers is a layer containing at least one metal selected from among Al, Fe, W, Mo, Sn, Ni, Co, Cr, Ti and noble metals (Column 3, lines 28-31).

Regarding Claim 27, Oodaira teaches that each of said resin insulating layers has a flat and level surface (see Figure 7).

Regarding Claim 29, the limitation that: "each of said resin insulating layers has a surface obtained by plasma treatment or corona discharge treatment", is a product by process limitation. If the product in the product-by-process claims are the same as or obvious from a product of the prior art, the claims are unpatentable even though the prior product was made by a different process. See *In re Thorpe*, 227 USPQ 964,966 (Fed.Cir 1985). A "product by process" claim is directed to the product per se, no matter how actually made, *In re Brown*, 173 USPQ 685; *In re Luck*, 177 USPQ 523; *In re Fessmann*, 180 USPQ 324; *In re Avery*, 186 USPQ 161; *In re Wertheim*, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); *In re Marosi et al*, 218 USPQ 289; and particularly *In re Thorpe*, 227 USPQ 964, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by

process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. Note that applicant has the burden of proof in such cases, as the above case law makes clear.

Regarding Claim 64, the limitation that: "each of the metal layers are formed by plating, PCD or CVD", is a product by process limitation. See explanation in claim 25.

Regarding Claim 65, Oodaira inherently teaches that said polyolefin resin has a dielectric constant value not more than 3 and dielectric loss tangent value not more than 0.05.

Regarding Claim 66, Oodaira inherently teaches that said resin insulating layer has a flat and level surface with an average roughness value of RA being not more than 1 μm .

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oodaira et al. (US Patent No. 4,715,126) in view of Brandli et al. (US Patent No. 5,227,012). As best understood by the examiner:

Regarding Claim 30, Oodaira teaches all the elements of the instant claimed invention as stated supra for claim 25, but fails to teach that each of said conductor

circuits has a metal layer composed of at least one metal selected from among metals (exclusive of Cu) of the 4th through 7th periods in Group 4A through Group IB of the long-form periodic table of the elements, Al and Sn on its surface and said metal layer on the surface of said conductor circuits has an interlayer resin insulating layer or a solder resist layer built thereon.

Brandli et al. teaches a printed circuit board (device of Figure 2) that each of said conductor circuits (reference number 2) has a metal layer (reference number 3) composed of at least one metal selected from among metals (exclusive of Cu) of the 4th through 7th periods in Group 4A through Group IB of the long-form periodic table of the elements, Al and Sn (column 3, line 63) on its surface and said metal layer on the surface of said conductor circuits has an interlayer resin insulating layer (reference number 5) built thereon

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Oodaira and Brandli in order to have each of said conductor circuits having a metal layer composed of at least one metal selected from among metals (exclusive of Cu) of the 4th through 7th periods in Group 4A through Group IB of the long-form periodic table of the elements, Al and Sn on its surface and said metal layer on the surface of said conductor circuits having an interlayer resin insulating layer or a solder resist layer built thereon, thus improving the integration, and allowing the circuits to be exposed to as high a current load as possible with adequate heat-dissipation.

Regarding Claim 31, Oodaira teaches all the elements off the instant claimed invention as stated supra for claim 25, but fails to teach that each of said metal layers built on the surface of said resin insulating layers has a Cu layer formed on its surface and said Cu layer has a conductor circuit constructed thereon. Brandli teaches a printed circuit board having a metal layer (reference number 1') built on the surface of a resin insulating layer (reference number 5) having a Cu layer (reference number 2') formed on its surface and said Cu layer has a conductor circuit (reference number 3') constructed thereon.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Oodaira and Brandli in order to have each of said metal layers built on the surface of said resin insulating layers having a Cu layer formed on its surface and said Cu layer having a conductor circuit constructed thereon, thus improving the integration, and allowing the circuits to be exposed to as high a current load as possible with adequate heat-dissipation.

10. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oodaira et al. (US Patent No. 4,715,126). As best understood by the examiner:

Oodaira teaches all of the elements of the instant claimed invention as stated supra for claim 25, but fails to explicitly teach that the thickness of each of said metal layers is 0.01 to 0.2 μm . It would have been obvious to one of ordinary skill in the art at the time the invention was made, to reduce the thickness of the metal layer to be in the range of 0.01 to 0.2 μm in order to improve integration of the device. In addition, it has been held that where the general

conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Response to Arguments

11. Applicant's arguments filed on 6/12/03, regarding claims 25-27,29 and 32, have been fully considered but they are not persuasive.

Applicant argues that Oodaira et al. fails to teach or suggest to use thermosetting polyolefin resin, and that therefore one of ordinary skill in the art would not have expected the effects mentioned by the applicant. The examiner, respectfully disagrees and points out that Oodaira teaches in column 3, lines 21-25, that the resin insulating layers may comprise a polyethylene resin, which is recognized in the art as a thermosetting polyolefin resin. Since the Oodaira invention is structurally equal, the desired effects will be achieved.

Applicant further argues that, Oodaira is silent about forming a metal layer on the surfaces of the resin substrate by plating, PVD, or CVD. The examiner respectfully points out that Oodaira teaches a metal layer (reference numbers 82,83) and in response to applicant's argument that the metal layer is formed by plating, PVD, or CVD, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the

prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "the metal layer is thin and has a uniform thickness") are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Furthermore, it is not inherent from the claimed processes (plating, PVD,CVD) that the resulting structure has a metal layer that is thin and with uniform thickness. Therefore, the argument is not persuasive.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "resins which show high adhesion to conductor circuits") are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Furthermore, since Oodaira teaches the structural limitations and the choice of materials claimed by applicant, it is inherent that the Oodaira invention will achieve the desired properties and effects. Therefore, the argument is not persuasive.

12. Applicant's arguments with respect to claims 30 and 31 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references teach some of the elements of the instant claimed invention: Yang et al. (US Patent No. 6,071,597), Tsukada et al. (US Patent No. 5,451,721), Santleben et al. (US Patent No. 5,460,767), Mizumoto et al. (US Patent No. 5,883,335), Reed (US Patent No. 4,211,603) and Chong et al. (US Patent No. 5,699,613).


15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to José H Alcalá whose telephone number is (703) 305-9844. The examiner can normally be reached on Monday to Friday.

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16. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on (703) 308-1233. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JHA

A handwritten signature in black ink, appearing to be 'JHA', with some faint, illegible text underneath it.